



L.A.R.C.
P.O. Box 2571
Thunder Bay ON
P7B 5G1

Hi-Q

February, 1993

Meetings: 7:30 P.M.
2nd Thursday each month
Room 210, McIntyre Building,
Confederation College.

Two Amateur Radio Operators Acquitted In Mischief Trial

"Not guilty," was the verdict in the criminal mischief trial against two amateur radio operators of Thunder Bay, Ontario on January 8, 1993. Ed Rehfuhs (VE3LML) and his XYL Ine (VE3OTV) had been charged with mischief under section 430(1)(d) of the Criminal Code of Canada, because their radio transmission was incompatible with some telephones, home electronic equipment and a toaster in their neighbourhood.

By E.W. Rehfuhs, VE3LML

On March 17, 1992, Ed (VE3LML) and Ine (VE3OTV) were contacted by the local inspector of the Department of Communications (DOC) regarding complaints by several neighbours that they were hearing unwanted voices on their telephones. The inspector checked the amateur radio station to ensure good AC and RF grounding was in place prior to conducting any tests with the complainants.

The local telephone company became involved with the cases of telephone problems, curing one problem by installation of an appropriate filter, another by replacing the telephone because the original telephone could not be filtered, and in the third case no action could be taken as the telephone was customer owned. There was some delay involved in solving the problems, as the first telephone repairman was not familiar with EMC problems and placed the blame on the amateur station rather than on the telephone equipment. This situation was clarified through discussion between the DOC and the telephone company.

In mid-April, the rotator was removed for maintenance and the antenna was tied in a fixed position. Neighbours were given the impression that the station was off the air due to the missing rotator. In fact Ine (VE3OTV) was on the air virtually every day during the next six weeks, yet in their statements to the police, one complainant indicated no interference was experienced during this period.

On June 5, 1992 the old 21 ft tower was taken down and replaced by a 40ft tower. This higher tower

triggered an avalanche of complaints. Suddenly, the unwanted voices in telephones and other entertainment equipment were louder than ever. One complainant later stated in the witness statement to the police, "Things quieted down for about six weeks or so. Now, we have our problem back, louder than before since the beginning of July 1992."

The neighbours applied simple logic to this situation. As long as the tower was only 21 ft high, they had appeared to have small problems; now with a tower twice the height, they claimed they had bigger problems.

On June 29, 1992 a series of tests were conducted at one complainant's residence to determine the level of the problem. Tests results revealed that no incompatibility was evident with the television set, a consumer-owned telephone, a toaster and a TV-VCR combination. On July 2, this complainant provided a videotape to the DOC which contained a very faint background voice disturbance. Toroid coils were provided for installation to determine if they would eliminate the slight problem, however it could not be determined if they were actually or properly installed.

Due to continued complaints, the DOC initiated intensive tests of the amateur radio station on August 18 and 19, 1992. The amateur radio station was tested on all the bands using all transmitting equipment available. The DOC also checked the telephones and home entertainment equipment at the amateur's residence, while transmitting at its maximum power output of 90 W.

Tests by the DOC inspectors showed that the transmitting equipment was working as intended. The

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spectrum analyzer showed that no harmonics were produced by the transmitting equipment.

In the 12-page long "Report of Electromagnetic Immunity Problem to Radio Sensitive Equipment on County Boulevard, Thunder Bay, Ontario, March to September 1992," the DOC wrote, "During radio transmission tests that were conducted by the amateur station, the Department monitored and analyzed the radio signals of the amateur radio station and found no transmitter defects. From all the tests conducted by inspectors of this Department, it appeared the amateur station was operating according to its license, within established regulations and certification requirements."

The DOC made arrangements with the two main complainants to conduct extensive tests on September 1, 1992 to determine the full extent of current problems. With test equipment in place at the amateur station, the complainant who had been tested in June was asked to assist in further tests, this complainant refused to allow the DOC inspector into her home, and indicated she was not interested in further tests; revocation of the amateur's station licence was the only acceptable solution to her. As a result, this residence was not re-tested.

The DOC contacted the second complainant who indicated she was willing to have tests conducted. While one DOC inspector was at the complainant's residence, the second inspector monitored the amateur radio transmitter.

Tests were done on the telephone, a television, two VCRs, a stereo system and three clock radios. The results of this test are stated in the DOC report, "Results of the investigations at the complainants residence revealed an immunity problem. The complainant's "radio sensitive" equipment lacks the circuitry required to operate properly in the presence of strong radio signals. It was demonstrated that the VCR will operate properly if toroid cores are installed on the VCR power line cords."

On September 2, 1992, the two DOC inspectors canvassed the neighbours around the amateur radio station. In their report, they mention eight immediate neighbours who did not have any problems.

The official DOC report concludes, "Although the complainants feel that the problem is entirely the fault of the amateur's radio transmitter, the inspectors concluded that various "radio sensitive" equipment at the above residences lack the circuitry required to operate properly in the presence of strong radio signals."

"It has been explained and/or demonstrated that some of the equipment will operate properly in the presence of strong radio signals if proper shielding and/or filtering is used correctly."

"In the matter of telephones, it was shown that certain combinations of good wiring, proper grounding and installation of radio frequency filters resolved the problem."

"As most manufacturers, importers or dealers of electronic equipment are interested in the performance of

their products, they should be advised by the consumer that their equipment is not functioning properly in an environment where a high level of radio signals exists. Some may offer to repair, replace or possibly refund the purchase price."

"Installing various external and internal suppression components, as described in our publications, was also suggested. Internal components should be installed by a qualified technician. As a guide to the technicians who may be unfamiliar with audio rectification, the Department makes available the publication entitled "Solving Interference Problems - Technical Handbook."

"The amateur operators and the applicable neighbours were encouraged to make every effort possible to re-establish communications, demonstrate flexibility and co-operation regarding the purchase of parts, resolution techniques and good relations."

On September 2, 1992, the DOC inspectors concluded their investigation, and since no transmitting restrictions were placed on the station, Inc (VE3OTV) was on the air waves that same afternoon. Rather than taking the advice of the DOC and to talk with the amateur radio operators, the complainants had a different solution. They called the police. At this point it should be pointed out that the complainants had formerly filed complaints with the mayor of Thunder Bay, their alderman, the Member of Parliament and the local cable TV network.

Around 18:10 EST on Sep. 2, 1992, two police officers appeared at the home of the amateur radio operators. They said, they had a noise complaint from neighbours due to the amateur's radio signals. The amateurs told the two police officers that the DOC had just completed an investigation and that their equipment had been found to be working properly, but that the equipment of the complainants had deficiencies which could be rectified. The amateur radio operators pointed out that this situation was outside of the jurisdiction of the police. Rather, it was a matter for the DOC, because the amateur radio station was operated under the authority of the federal Radio Communications Act. The police were advised to get in touch with the local inspector of the DOC to get confirmation of events which had taken place up to this time.

For several days everything seemed normal, however on Sep. 18, 1992 two different policemen showed up. One of them was the supervisor of the cruiser patrol. This time, the complaint was apparently a neighbourhood dispute. The amateur radio operators told them what they had told the first two policemen. These two police officers didn't want to get involved. They stated that the officers that had called before would take care of the matter.

On Sep. 28, 1992 at 18:43 EST, the two police officers who had contacted the amateur radio operators initially showed up to lay a charge of mischief under the Criminal Code of Canada. They weren't sure whom to

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charge but decided to charge Ed (VE3LML). He claimed he was never on HF all year long. That didn't matter much to the police. They completed the "Appearance Notice Issued by a Police Officer," when they heard that Ed (VE3LML) was a licensed amateur radio operator.

In the discussion with the two police officers, Ine (VE3OTV) had pointed out that Ed should not be charged, because he was never on the air. She claimed she was the active operator in the house, so one of the police officers got another appearance notice and Ine (VE3OTV) was also charged with mischief under sec. 430(1)(d) of the Criminal Code of Canada.

The Crown Attorney agreed to proceed with the criminal charges based on the report prepared by the investigating police officer. In that brief the police constable wrote, "One complainant has canvassed her neighbours and has found eleven more neighbours who are having the same transmissions and problems with their appliances."

For the trial, the police and crown could only present four witness statements, one, by the next door neighbour who did have problems, most of which had been shown to be curable, a second who had been checked and only a minor problem was found, one whose telephone problem had already been cured, and the fourth who indicated they did not have any problems worth reporting when she contacted the DOC at the request of one of the major complainants. The statement in the police report that eleven neighbours were affected was apparently based on information provided by one of the main complainants, however it was not verified by the police. The DOC report refutes this statement, as eight neighbours contacted by the DOC stated they had no problems.

The brief to the crown continued that the accused had advised the investigating police officer to contact the local inspector of "Thunder Bay Communications." He probably meant the federal Department of Communications, because the name "Thunder Bay Communications" is registered by a private company in Thunder Bay that sells communications equipment. The report then continues that the investigating police officer had in fact talked to the local DOC inspector and he wrote, that the inspector explained, "that there is nothing Thunder Bay Communications (obviously meaning the DOC) can do, because the accused are operating below legal limits and are following all radio guidelines."

The local DOC inspector was contacted at his residence on the evening of September 2, 1992 by a detective from the police department regarding this matter, not by the investigating officer as indicated in the police report. In this phone discussion, the DOC inspector advised the police that a full investigation had just been completed, nothing wrong was found with the amateur station, and that a full report was being prepared and could be made available to the police to clarify the situation.

Unfortunately, this offer was never taken up by the police department.

The statement of the police constable regarding "operating below legal limits" was to cause a problem between the lawyer of the accused and the assistant crown attorney at the preliminary hearing. After the lawyer of the accused explained the real legal situation to the crown, the assistant crown attorney was almost willing to drop the charges at that hearing, if the police report had not stated "operating below legal limits." The crown concluded that the amateur radio operators were operating outside the permitted frequencies. In fact, they had stated to the police, that they were operating below legal power limits, because they could legally transmit with 1,000 watts but were using only 90 watts power output.

The Criminal Code of Canada states under sec. 430(1)(d) the following: "Every one commits mischief who wilfully obstructs, interrupts or interferes with any person in the lawful use, enjoyment or operation of property." If convicted, the penalty could be as harsh as a two-year jail term.

This charge of a criminal offence presented the possibility of tremendous consequences for the accused and all amateur radio operators in Canada, if it ever came to a conviction. Therefore, the accused hired a local criminal lawyer to handle the case.

As Ed (VE3LML) was a long-time member of the Canadian Radio Relay League (CRRL), he contacted Ray Staines (VE3ZJ), the general manager of the CRRL. Ray went into action, sending faxes across the country. One went to the legal counsel of the CRRL, Tim Ellam (VE6SH) who is a lawyer with the prominent law firm McCarthy Tetrault in Calgary. This law firm has offices in all major cities in Canada as well as in London, England and in Hong Kong.

Only one day after they got charged, Tim Ellam sent a fax to Ed (VE3LML). He wrote, that as CRRL counsel he would be prepared to assist Ed (VE3LML) with any information or material that he would require. He also mentioned, that as far as he knows, this was the first time that an amateur had been charged under a section of the Criminal Code for a matter which was really governed by the Radio Communications Act. He also figured, because his station had received a clean bill of health by the DOC that section 429(2) of the Criminal Code would apply and override section 430.

The Criminal Code states under section 429(2): "No person shall be convicted of an offence under section 430 to 446 where he proves that he acted with legal justification or excuse and with colour of right." Tim Ellam felt, that this section would apply in this situation, because the DOC saw no problem with the amateur radio station.

Although, the defence lawyer acting for the amateur radio operators presented convincing facts, the crown wanted a trial because of the statement by the

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investigating police officer that the amateur radio operators were "operating below legal limits."

In the meantime, Tim Ellam was in touch with the legal department of the DOC in Ottawa to caution them about the seriousness of the situation. In this case, the police and the crown apparently were disputing the power and right of the federal Department of Communications under the Radio Communications Act. The legal department of the DOC in Ottawa was on alert and one lawyer of the DOC contacted the defense lawyer.

In the middle of December 1992, the DOC office in Sault Ste. Marie, Ontario released, at the request of Ed (VE3LML), supplementary data not included in the DOC report listing eight parties who had no problems, although they live in the immediate neighbourhood of the amateur radio station.

This information was also presented by the DOC to the assistant crown attorney who then contacted the DOC and asked for further clarification. In this telephone discussion the crown realised that there really was a Radio Communications Act that looked after amateur radio operators and also the problems mentioned by the complainants in the criminal court case. The crown was also made aware of the powers and remedies available to the DOC under this act. This conversation resulted in the favourable break-through.

When Ed (VE3LML) and Ine (VE3OTV) appeared on January 8, 1993 the fourth time before the judge, the crown did not present any evidence and the judge's verdict was: "not guilty." The amateurs had received an acquittal. The defense lawyer insisted on an acquittal rather than a withdrawal to prevent the police from laying the same charges in the future. Since January 8, 1993 both amateur radio operators are back on the airwaves. They voluntarily refrained from transmitting from the day the charges had been laid to preclude further charges. They didn't want to give the police a reason to lay hundreds of additional but identical charges.

Although, the time from September until January was tough for Ed (VE3LML) and Ine (VE3OTV) and affected their health, they discovered the support of the local, national and international amateur radio community. They received support not only by the many local amateur radio operators who always showed up at the four court dates, but also by mail, fax and on the air.

Not being able to operate from home during these dark days, Ine (VE3OTV) found a solution. Only weeks before being charged, she and Ed (VE3LML) had given their son Axel (VE3OPF) for his birthday a complete set of HF mobil antennas. Those were installed on the 3/4-ton truck of the family and Ine (VE3OTV) was operational. She kept contact with her many friends in Canada, the U.S.A. and overseas. She discontinued her transmissions by the end of December 1992 when the mercury dipped below minus 20 degrees.

It was reported on local television and the front page of the local newspaper the next day that both amateur radio operators had been acquitted and that the DOC had found that the amateur radio station was operating according to the issued license and that the equipment of the complaining consumers was the real problem.

This didn't satisfy two of the complainants who had also completed witness statements for the police. They complained to a reporter, that they still had problems and indicated that they were not interested in fixing their equipment.

On January 11, 1993, one of the complainants who had received a copy of the DOC report with the test results regarding her own equipment called the local DOC office and asked for further help. Since a complete investigation had been carried out and solutions had been recommended, no further action was being planned.

Perrin Beatty Asked To Help EMC Victims

CARF wants DOC to "exempt" the public and amateurs from resolving costly EMC problems. American amateurs are given exemption by the FCC. In a letter to the Honourable Perrin Beatty, Minister of Communications, CARF's EMC Committee Chairman Ralph Cameron VE3BBM stated, "The public and indeed those of us licensed by the Department, and who are operating in accordance with the terms and conditions granted to us, are simply being victimized by the reluctance of industry ... to share in establishing Electromagnetic Compatibility (EMC) standards in Canada.

In a plea to Perrin Beatty, VE3BBM noted that amateurs and the public are the victims of an electronics industry who apparently do not want to establish EMC standards for R.F. susceptible consumer products. Amateurs are left to fend for themselves when neighbours complain that their VCR, TVs, stereos and phones malfunction due to nearby R.F. fields. It's unfair to consumers! It's a costly exercise for amateurs! It's a costly business for DOC! The makers of electronic consumer equipment must be held accountable for the EMC performance of their products.

CARF wants the Minister to act on this crucial issue by:

- Placing the responsibility of resolving product susceptibility problems where it belongs, with the electronics industry. Industry should provide a "focal point" (a group) to take on the resolution of complaints.

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- "Exempting" amateurs from unfair costs suppressing their neighbours' R.F. susceptible electronic equipment. U.S. amateurs are exempt!
- Moving heavy involvement away from DOC and amateurs. Industry must stop burdening taxpayers and amateurs with unfair social, political and economic costs caused by technical design deficiencies.

CARF encourages amateurs and amateur radio clubs to write to Mr. Beatty in support of these requests for fair play. Send a copy of your letter to the Minister to:

The CARF EMC Committee
P.O. Box 356
Kingston, Ont., K7L 4W2

We need standards! The electronic industry must stop victimizing taxpayers! The Minister must act now!

From CARF News Bulletin 18-92 — 30 Dec. 21:15

LARC Annual Dinner Meeting

Thursday, February 11, 1993, the Annual dinner Meeting convenes in the lower lounge at the Pagoda Garden Dinning Lounge, at 1075 Dawson Road. This year we will enjoy a smorgasbord style dinner, at a cost of \$18.00 per person, taxes included. If you prefer other dishes you may order from the regular menu at the listed price.

The guest speaker this year will be Mike Jones. Mikes' experiences during his recent kayaking tours of Lakes Baikal and Superior were mentioned in Bobs', VE3JAB feature article in the October 1992 issue of HI-Q. Mikes' presentation includes slides and focuses on the preservation of the worlds two largest lakes. It should be both informative and entertaining.

Husbands, wives, boyfriends, girlfriends or other friends are all welcome. We also welcome out-of-town visitors. Payment in advance is preferred. Negotiate with Skip, VE3BBS; let him know how many are in your party to ensure adequate seating is available. The volunteer services of the midnight rounds-men AKA VE3SNW and VE3WCT are again being put to good use delivering tickets.

We Welcome!

As announced in the last Hi-Q, Jason Hammond passed the Basic Qualification. Now as a reward for his patience, he is the proud owner of call, VE3JZN. Congratulations Jason.

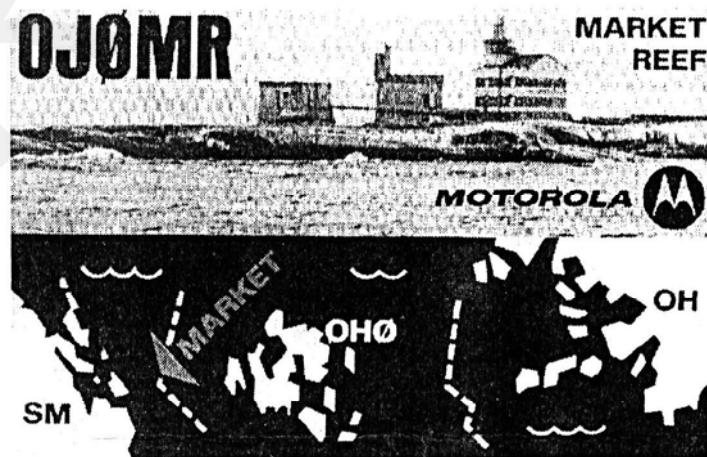
2M "Round Table" on YQT Takes Off

A few weeks ago, Marion VE3MJN and Ine VE3OTV started a friendly get-together in a round table style format on VE3YQT. Increasingly, local YLs and OMs have joined Ine and Marion in informal discussions at 9:00 AM local time, Monday through Friday on the YQT repeater. Everyone is welcome to join the morning conversation. As opposed to a formal net, the round table concept gives everyone a chance to get the microphone whenever you want it and for as long as you have something to say. For newcomers to the airwaves and YLs, this is a fantastic opportunity to further enjoy the use of their radio equipment. Don't be shy, pick up the mike and check in.

LARC Meeting Room Change

After much arm twisting Ed VE3SNW managed to get our old room back for weekly classes and monthly meetings. For the remainder of the year, we will be using room 245 in the McIntyre Building, Confederation College.

Here's a Rare One For You



OJ0/OH3AC (Lahti Amateur Radio Club)

Landing: Wed. 24.02.1993, operating to Sun. 28.02.1993
All bands 1,8 to 28 (50?) mHz, all modes, incl. RTTY
Landing will be done by helicopter from Åland Island

MARKET REEF, OJ0, ("Märket", Swedish language = 'Mark')
DXCC-country no. 322 since fall 1969,
Location 68° 18' 10" N — 19° 08' 03"
E — Europe (EU) — ITU ZONE: 18, CQ ZONE: 15
Beam bearing about 32° from Thunder Bay
By boat 3 hrs west from Åland Island (separate DXCC-country: OH0), size of the "rock": 85x300 m, height abt 3 m, 2/3 owned by Finland, 1/3 by Sweden. Finnish lighthouse built 1883. Swedish portion of Reef not accepted for separate DXCC-country
First operation: OJ0MR 26.-31.12.69, 9800 qso's, 140 countries, by OH0NI, OH2BDP, -BW, -KK, -BH

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1993

SUN	MON	TUE	WED	THU	FRI	SAT
	1 7:00 PM 2 Metre Net VE3YQT	2 7:00 PM CW Class	3	4 7:00 PM Ham Class	5	6
7	8 7:00 PM 2 Metre Net VE3YQT	9 7:00 PM CW Class	10	11 6:30 PM LARC Annual Dinner Meeting	12	13 Midwinter Madness
14 Valentine's Day 	15 7:00 PM 2 Metre Net VE3YQT	16 7:00 PM CW Class	17	18 7:00 PM Ham Class	19	20
21	22 7:00 PM 2 Metre Net VE3YQT	23 7:00 PM CW Class	24	25 7:00 PM Ham Class	26	27
28	Midwinter Madness — February 13, 1993; 7:00 AM to 2:00 PM 12 th Annual Hobby Electronics Show — National Sports Center — Blaine, Minn. — 1700 - 105 th Ave. NE. <ul style="list-style-type: none"> ◦ Code Classes on Mondays are Held at Norm VE3XRC's shack, 217 University Drive. Tel: 577-9316 ◦ Classes on Thursdays are held in Room 245, McIntyre Building, Confederation College. ◦ 11 Feb, 6:30 PM — LARC Annual Dinner Meeting — Pagoda Garden Dinning Lounge, 1075 Dawson Road. 					

Northwestern Ontario Amateur Radio

Call-Book

Cumulative Addendum

For first and second printings.

Issued with February, 1993 Hi-Q.

Addendum, Page 5 Correction

The Addendum mailed with January Hi-Q directed deleting the record for call VE3GQH. That call is not in the Call-Book. The record that should be deleted is VE3GHQ.

Address correction

For VE3KUZ: Delete 622; Insert 662.

Phone Number Change

The residential phone number for Vic, VE3AKX is 929-2131.

Moved – New address

VE3XIC has moved, Harold's new address and phone number are:

600 South James Street
Thunder Bay ONT P7E 2V7
807-475-4302

Silent Key

It is with deep regret that we record the passing of Walter, VE3LMW. Our condolences to family and friends.

Another spelling correction

VE3BQR, Bill does not use an "r" in his surname, I stuck one in and I don't know why. (Perhaps I was thinking of a software producer.) The correct spelling is "Boland".

New Amateur

We welcome VE3JZN Jason Hammond

124 Woodside Street
Thunder Bay ONT P7A 7G6
807-767-7891

Call change

Forrest McQuaker of Devlin, ONT has a new call. Delete VE3WFA, insert VE3YJX.

Red Lake District – Updates

Norm, VE3PMY sent in these updates for the members of the Red Lake District Amateur Radio Association. TNX Norm.

For VE3JWZ; change Box number to read 355 vice 158 and add phone number 807-735-2156.

A new call and a corrected phone number for Orren; delete VE3EDQ and 622-2549, insert VE3VQ and 735-2549.

Add phone numbers for the following:

VE3ULD 807-735-2549 and
VE3ULE 807-727-3572

The following are new Red Lake District Calls:

VE3OPG Orville Gentes
Box 887
Red Lake, ONT P0V 2M0
807-727-2359

K8QZO John Musselman
Box 315
Red Lake, ONT P0V 2M0
807-727-2400

VE3RGF Jonathon Peachey

Box 154
Masden, ONT P0V 2C0
807-749-2217

VE3PTE Ezra T. Peachey

Box 428
Red Lake, ONT P0V 2M0
807-727-2713

VE3DKE Keith Showalter

Box 315
Red Lake, ONT P0V 2M0
807-727-2224

VE3DSU Don Showalter

Box 315
Red Lake, ONT P0V 2M0
807-727-2224

VE3JXS Janet Simmons

Box 676
Red Lake, ONT P0V 2M0
807-727-3358

VE3KFX Keith Fretz

No further data available on Keith now, watch for an update in a future Adendum.

Red Lake District Repeater:

VE3RLD is located in Red Lake and operates on 147.00 MHz output and 147.60 MHz input. Please add this data to page 35.

They'll Do It Every Time

By Jimmy Hatlo



145.550 Mir Space Station Voice and Packets 279.000 Suit to Orbiter and Suit to Suit

146.550 SAREX (Shuttle Amateur Radio Experiment) Not on all missions. 259.700 Shuttle Primary Air to Ground, also Suit to Orbiter

146.550 SAREX (Shuttle Amateur Radio Experiment) Not on all missions. 259.000 Air to Ground or Suit to Orbiter

You can only hear these transmissions if the spacecraft is above the horizon at your location.

Spacecraft Frequencies

W6VIO Jet Propulsion Labs (Pasadena CA) 3.840 LSB, 21.280 USB

W6RR Johnson SFC (Cleart Lake TX) 3.850 LSB, 7.227 LSB, 14.280 USB, 21.350 USB, 28.495 USB

WANAN Goddard SFC (Greenbelt MD) 3.860 LSB, 7.185 LSB, 14.295 USB, 21.395 USB, 28.650 USB

A radio capable of Single Side Band (SSB) reception is required. Frequencies in MHz.

The broadcasts which follow are transmitted by Amateur Radio Clubs at the NASA centers given.

Shuttle Coverage on Short Wave.

STS-64 is currently scheduled for launch on 93 Jan 13

STS-65 is currently scheduled for launch on 93 Feb 25

STS-66 is currently scheduled for launch on 93 Mar 23

STS-67 is currently scheduled for launch on 93 Apr 29

STS-68 is currently scheduled for launch on 93 Jul 09

STS-69 is currently scheduled for launch on 93 Nov 16

STS-70 is currently scheduled for launch on 93 Dec 07

STS-71 is currently scheduled for launch on 93 Dec 13

STS-72 is currently scheduled for launch on 93 Jul 09

STS-73 is currently scheduled for launch on 93 Aug 26

STS-74 is currently scheduled for launch on 93 Nov 16

STS-75 is currently scheduled for launch on 93 Dec 07

STS-76 is currently scheduled for launch on 93 Jan 13

STS-77 is currently scheduled for launch on 93 Mar 23

STS-78 is currently scheduled for launch on 93 Jul 09

STS-79 is currently scheduled for launch on 93 Aug 26

STS-80 is currently scheduled for launch on 93 Nov 16

STS-81 is currently scheduled for launch on 93 Dec 07

There are nine shuttle launches planned for 1993, listed below are the programmed launch dates.

1993 Shuttle Schedule